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(71) Applicant (for all designated States except US): CH2M HILL, INC. [US/US]; 9191 South Jamaica Street, Englewood, CO 80112 (US).		
(72) Inventors; and		
(75) Inventors/Applicants (for US only): MALONEY, Martin, David [US/US]; 29556 Kirkwood Court, Evergreen, CO 80439 (US). WAGH, Arun, S. [US/US]; 4 Helens Way Court, Naperville, IL 60565 (US).		
(74) Agents: SWANSON, Barry, J. et al.; SWANSON & BRATSCHUN, L.L.C., 1745 Shea Center Drive, Suite 330, Highlands Ranch, CO 80129, ETATS-UNIS D'AMERIQUE (US).		

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(54) Title: METHOD OF WASTE STABILIZATION WITH DEWATERED CHEMICALLY BONDED PHOSPHATE CERAMICS

(57) Abstract: A method of stabilizing a waste in a chemically bonded phosphate ceramic (CBPC). The method consists of preparing a slurry including the waste, water, an oxide binder, and a phosphate binder. The slurry is then allowed to cure to a solid, hydrated CBPC matrix. Next, bound water within the solid, hydrated CBPC matrix is removed. Typically, the bound water is removed by applying heat to the cured CBPC matrix. Preferably, the quantity of heat applied to the cured CBPC matrix is sufficient to drive off water bound within the hydrated CBPC matrix, but not to volatilize other non-water components of the matrix, such as metals and radioactive components. Typically, a temperature range of between 100°C-200°C will be sufficient. In another embodiment of the invention wherein the waste and water have been mixed prior to the preparation of the slurry, a select amount of water may be evaporated from the waste and water mixture prior to preparation of the slurry. Another aspect of the invention is a direct anhydrous CBPC fabrication method wherein water is removed from the slurry by heating and mixing the slurry while allowing the slurry to cure. Additional aspects of the invention are ceramic matrix waste forms prepared by the methods disclosed above.

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B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,830,815 A (WAGH et al.) 03 November 1998 (03.11.1998), columns 3-7	27-28, 30-37
—		1-26, 29
Y	US 5,732,367 A (YOST et al.) 24 March 1998 (24.03.1998), columns 8-14	1-15
Y	US 5,457,266 A (BEGE et al.) 10 October 1995 (10.10.1995), columns 1-3	5-7 and 16-26
Y	US 5,645,518 A (WAGH et al.) 08 July 1997 (08.07.1997), columns 3-9	10, 21, 29

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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